Chapter 3 – The Affected Environment

I. Introduction

The study area is located on the edge of the Prairie Pothole region of northwestern Minnesota, a region known for its historic high-quality prairie wetlands and waterfowl numbers. The region includes uplands and wet basins draining to the Red Lake and Sandhill Rivers. These rivers flow into the Red River of the North and ultimately to Hudson's Bay. The site is situated at the top end of at least 10 sub-watersheds. The north side of the project is bordered by Minnesota State Highway 2. The vast majority of the wetlands in the central and western portions of the study area have been either fully or partially drained. Original wetlands still exist on the eastern portion of the area; primarily near Maple Lake. Several of these wetlands are greater than 40 acres in size.

Historically, the Core Restoration (Alternative A) portion of the study area was dominated by large wetland basins which were located between beach ridges created by historic glacial Lake Agassiz. Some of these wetlands were over 2 miles long. In addition, the landscape included many seeps (fens) and numerous wet prairie habitats.

The extensive, historic tallgrass prairie of the glacial ridge region supported large populations of free-roaming bison, elk, waterfowl and prairie chickens. Shrubs, generally snowberry and buffalo-berry occurred along the drier sand ridge tops and were a primary food source for sharp-tailed grouse and prairie chickens. Hunters in the early 1900's reported large concentrations of these birds. Willow was also common along the edges of deepwater wetlands where they received some protection from periodic fires that visited the area.

Today, the bison and elk herds are gone and little remains of this vast prairie wetland and grassland complex. Remnant tallgrass prairies found on the western and central portions of the study area are now grazed by cattle. Aspen trees have established themselves in scattered locations as a result of the lack of fire. On the eastern edge, remnant oak savannas still dot the landscape interspersed with sites being overtaken by aspen. The beach ridges to the south of the study area also contain a mix of open pastures, croplands, existing and drained wetlands and larger blocks of aspen woodlands that have pioneered into the area over the past sixty years.

II. Geographic/Geologic Features

The study area is located in Polk County approximately 12 miles east of Crookston, Minnesota. The region is primarily flat, approximately 1,000 feet above sea level, with

low, gently rolling hills. The study area is situated on the edge of the northern tallgrass prairie between the flat Red River Valley flood plain on the west and the rolling hardwood forest and lakes region to the east.

Physiographically, the project is located in the old outwash plain of the historic Lake Agassiz. The ancient beach ridges, running northeast to southwest, are clearly visible from the air and from many locations on the ground. A glacial moraine node exists immediately to the east of the project. The resulting collection of lakes within the node created a "fire shield" on the edge of the prairie which resulted in the establishment of a maple-basswood forest community, the farthest west extension of this habitat type in the United States.

Figure 3

III. Description of Habitat

The proposed refuge location is situated on the edge of the Prairie Pothole region of Western Minnesota between the flat Red River Valley flood plan on the west and the rolling hardwood forest and lakes' region on the east. The area contains numerous existing and drained wetland basins, fen habitat, quality and degraded (heavily grazed) northern tall grass prairie (TGP) habitat with associated areas of small scattered aspen and oak stands and farmland, much of it recently converted tall grass prairie/pasture lands. It would be our goal to facilitate restoration of the grasslands and wetlands to as close to pre settlement conditions as practical.

The former wetlands on the east side of the study area once served as a major ground water recharge location for the prairie habitats located on the west side of the site. Concern has been expressed for the fate of the threatened Western Prairie Fringed Orchid (*Platanthera praeclara*) populations on the prairie lands as a result of all the drainage that has occurred to the east.

Historically, numerous wetlands and fens were located between the glacial ridges. Many of these have been significantly drained. The area is a mosaic of pastures, cropland, small aspen woodlots, ungrazed prairie, and numerous undrained and drained wetland basins and several gravel/sand operations.

A significant number of land parcels within the study area are enrolled in the Conservation Reserve Program (CRP) administered by the U.S. Department of Agriculture. The CRP is a voluntary program that offers annual rental payments and cost-share assistance to establish long-term resource-conserving covers on eligible land. Annual rental payments are made based on the agriculture rental value of the land. The program also provides cost-share assistance for establishing natural vegetative cover and for other

approved conservation practices. The durations of contracts are from 10 to 15 years. Current CRP enrollment in the area includes a combined total of 5,272 acres in Kertsonville, Gentilly and Onstad Townships (Hillcamp, Pers. Comm.) and 7,508 acres in Tilden, Grove Park and Godfrey Townships (Reading, Pers.Comm.). In addition, about 8,000 acres are enrolled in CRP within a few miles north of highway 2 and the study area (Balsted, Pers. Comm.).

Many acres of the tallgrass prairie pasture lands within the study area have been disturbed by heavy equipment and all glacier-strewn boulders are now bulldozed into piles for disposal. The previous landowners of Tilden Farms planned to convert more pasture to croplands. Extensive illegal drainage activities have also occurred in the proposed project area. No legal action has been taken on this case to date. Despite the extensive drainage, many former wetland sites still retain enough water to make crop production very difficult during wet years. Many farmers in this area have trouble with planting crops in wet fields and flooding losses are common.

Immediately to the east of the study area, a glacial moraine node exists. The resulting collections of lakes along the node created a “fire shield” on the edge of the prairie which resulted in the development of a maple - basswood forest community, the farthest north and west extension of this habitat type in Minnesota (Kuchler, 1964). Rydell National Wildlife Refuge is located in this forest habitat.

IV. The Current Ecological Condition

Fish and Wildlife

Mammals

The study area supports a variety of resident mammals that are locally abundant depending on the availability of food sources, loafing areas and security habitat. White-tailed deer and whitetail jackrabbits are common throughout the study area. Furbearers, including fox, coyote, long and short tailed weasels, skunk, mink, beaver and raccoons also are locally common and seen in the area on a regular basis. All of these species are very familiar to local farmers, hunters and highway motorists.

Mammals tend to be most abundant in “edge” habitats; especially those that border agricultural fields. Agricultural crops are seasonally important food sources to some of the resident mammals, especially deer. However, the availability of natural foods during winter, spring and early summer places a strict limit on local mammal populations.

Although moose crossing signs are in place along highway 2, the local moose population has declined in recent years. Regionally, the moose population has also shown a marked decrease in size. Research is currently underway to access the reason for the decline of moose in northwestern Minnesota. Locally, the removal of many former willow stands and the current lack of corn or sunflower fields may be a factor.

At the time of European settlement in the mid-1800s the area was home to herds of elk and bison. The tall grass prairie dominated the landscape. Today, local residents still find bison skulls and elk antlers within the study area.

Birds

The existing beach ridge wetlands are an important stopover in spring and fall for many migratory birds. Puddle ducks; primarily mallards, some wood ducks, widgeon and blue-winged teal, and Canada geese are frequently observed where water is available. Large numbers of sandhill crane (estimates of over 20,000) also frequent the area to refuel on their journey from wintering to nesting grounds and during their return to the south. A small number currently remain in the area to nest. Large flocks of white pelicans and tundra swans are also seen in the spring when water conditions are favorable. Resident Canada geese (giant) use the open water wetlands, including the gravel pit located in the center of the study area. Concentrations of geese have been observed on the pit during the fall migration period and provide local hunting opportunities.

Greater prairie chickens and sharp-tailed grouse are residents of the study area. In 1999, at least 21 prairie chicken booming grounds were documented within the study area (Minnesota Prairie Chicken Society). Booming grounds, also know as dancing grounds or Leks, are gathering sites for male prairie chickens and sharp-tailed grouse trying to attract females during the breeding season. Use of the recorded sites ranged from 3 to 30 individual males.

On the Nature Conservancy's Pembina Trail Preserve, biologists have conducted grass-land bird surveys and have documented the many species present in the area. The following migratory bird species are listed as Resource Conservation Priorities by Region 3 of the U.S. Fish and Wildlife Service, and will benefit from the proposed project: marsh/sedge meadow species – American Bittern, least bittern, mallard, blue-winged teal, trumpeter swan, black tern, upland sandpiper, sedge wren, northern harrier; wet prairie/tall grass prairie species: field sparrow, grasshopper sparrow, bobolink, and short-eared owl.

If water conditions are favorable, the study area is also used by numerous migrating shorebirds. Additional species known to use the area include Le Cont's sparrow, clay-colored sparrow, vesper sparrow, common snipe and western meadowlark.

Fish

Three drainage systems occur within the study area. A fishery survey of the Red Lake River system documented 46 species. No current information is available on the Sandhill River system. In addition, no surveys have been conducted on the streams or lakes within the study area. Populations of gamefish, such as perch, sunfish and northern pike, are probably restricted to Bakken Lake and the scattered deepwater lakes on the southeast end of the study area. The extensive drainage that has occurred throughout the study area has left limited fish habitat. However, some small native species, such as white sucker and creek chub, can be observed in the drainage ditches and in pools near road culverts.

Reptiles and Amphibians

Streams, ditches and wetland basins provide the aquatic habitat required for a variety of turtles, frogs, toads, salamanders, and snakes. Site-specific abundance data is not available for the study area. However, at least 18 species of amphibians and reptiles have been documented at the nearby Rydell National Wildlife Refuge (USFWS 2000). These species are important food sources for many mammals, birds and fish. Their numbers and diversity are often indicators of the health of an ecosystem. Many species of reptiles and amphibians are declining on a state and nationwide basis.

Threatened and Endangered Species

No Federally-listed wildlife species are known to occur on the study area. One flowering plant, the Western Prairie Fringed Orchid (*Platanthera praeclara*), listed as threatened under the Endangered Species Act, has been documented at several sites in the study area. In addition, Minnesota lists nine bird species of special concern, threatened or endangered status for this region of the state.

V. Biological Diversity

Biological diversity, in simple terms, is the variety of life and its processes. This variety may occur at the genetic, species, community, and ecosystem level. Biodiversity supports the stability, integrity, and resilience of ecological systems. It provides the raw material for evolving life and the "ecosystem services" upon which we depend, such as soil building, erosion control, and hydrologic cycles. In the State of Minnesota, like elsewhere, biological diversity is declining. Loss of habitats, both physical and in function, is the greatest threat to biological diversity. The study area retains a variety of plants and animals that are comparable to other farmed beach ridge areas within northwestern Minnesota. However, a significant portion of the natural biological diversity, especially outside of the remnant tall grass prairie areas, has been lost.

Threatened Western Prairie Fringed Orchid (Photo by Gary Muehlenhardt, USFWS)

VI. Wetlands and Riparian Zones

Remaining wetlands constitute only a small portion of the study area. The instream waters of Burnham, Badger/Maple Creek and the Gentilly River, the field drainage ditches, gravel pit ponds and a few remaining natural basins comprise the extent of permanent wetland types in the study area. Up to 12,700 acres of restorable wetlands occur in the study area.

Wetland communities are among the most biologically productive areas on earth. Wetlands also help regulate and maintain the hydrology of creeks, rivers and lakes by storing and slowly releasing waters. They maintain the quality of water by storing nutrients, decreasing sediment loads, and reducing erosion. The former wetlands of the Glacial Ridge area once provided these functions to the Red Lake and Sandhill rivers and downstream communities.

Riparian, or stream bank zones comprise a portion of the study area. The narrow, grass ditch banks that currently exist along the former Gentilly River, Burnham Creek and the upper Badger/Maple Creek drainage would be classified as riparian habitat. These important areas serve as the transition zone between the terrestrial and aquatic environments. Stream bank vegetation contributes to channel structure, stabilizes erosive stream bank soils, shades/cools flowing water and improves fish habitats.

VII. Archaeological and Cultural Resources

Only two archeological sites have been identified on the entire land base being considered for inclusion in the proposed refuge. Both are historic period Western culture building sites located on existing federal waterfowl production areas. The Polk County map indicates approximately 50 extant farmstead and other buildings sites. As of September 26, 2000, Polk County contains 6 properties on the National Register of Historic Places. All these properties are historic period structures located in cities.

European settlement of the Glacial Ridge area was slow and sparse compared to other regions of Minnesota. During the mid-19th century the study area was part of the historic Red River oxcart trail system. The oxcart trails were used by immigrants traveling between St. Paul and the Selkirk Settlement near present day Winnepeg, Manitoba. The Woods (Pembina) Trail, a segment of the main route, traversed the west end of the study area (Minnesota Historical Society 1979).

Despite such a limited data base, the assumption must be made that undiscovered prehistoric sites are likely, especially for the Woodland culture (500 B.C. to A.D. 1650), as well as the sites of former buildings and structures. The Cheyenne tribe is the earliest historic period tribe in the area, replaced by the Ojibwa.